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Sperm made from human bone marrow

Scientists say they have successfully made immature sperm cells from human bone marrow samples.

If these can be grown into fully developed sperm, which the researchers hope to do within five years, they may be useful in fertility treatments.



If mature sperm can be grown they could be used in fertility treatment

But experts have warned the findings from the German study should be interpreted with caution at this very early stage.

And proposed new laws would ban their use in fertility treatments in the UK.

How sperm is made from bone marrow tissue

The government's recent fertility White Paper proposes a ban on using artificially created sperm or eggs in assisted reproduction.

The researchers from the Universities of Göttingen and Münster and the Medical School of Hannover isolated adult stem cells - cells that have the ability to become many types of tissue in the body - from bone marrow samples taken from male volunteers.

“ This kind of work will be very useful in helping us understand the biology of how sperm are made ”

Dr Allan Pacey

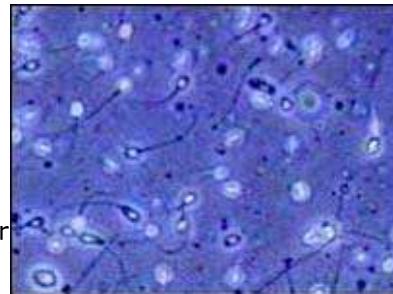
Spermatogonial cells

Normally these stem cells from the bone marrow would develop into the different cell types in muscle tissue.

But the researchers induced a small number of them to develop into what appeared to be spermatogonial cells - cells found in the testes which would normally develop into mature sperm cells.

This is the first time human spermatogonial cells have been made artificially in this way.

And lead researcher Professor Karim Nayernia, now at the North-east England Stem Cell Institute based at the Centre for Life in Newcastle upon Tyne,

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said he hopes his investigations will mean he might one day be able to treat young men rendered infertile by chemotherapy. Scientists have grown artificial sperm precursor cells

He said: "We're very excited about this discovery.

"Our next goal is to see if we can get the spermatogonial cells to progress to mature sperm in the laboratory and this should take around three to five years of experiments."

He acknowledged that the law may be a stumbling block.

Professor Harry Moore of the Centre for Stem Cell Biology at the University of Sheffield said: "This finding is of interest but we really need to be very cautious about the interpretation."

“ We are still many years away from developing any therapies for infertility using such techniques ”

Professor Harry Moore

The changing of stem cell types observed by the researchers, from pre-muscle to pre-reproductive cells, is known as trans-differentiation.

Caution needed

And Professor Moore said nearly all similar observations of trans-differentiation in adult stem cells had not been confirmed when tested rigorously, as the results could be misleading.

He said: "This is a fast moving field but we are still many years away from developing any therapies for infertility using such techniques."

And he warned that manipulating stem cells to develop into mature sperm could cause permanent genetic changes in the sperm, making the cells unsafe to use in fertility treatments.

However, Dr Allan Pacey, secretary of the British Fertility Society, said: "This kind of work will be very useful in helping us understand the biology of how sperm are made.

"That in itself may provide some insight into why things sometimes go wrong and may lead to new approaches to treating male infertility."

The findings were presented at an international fertility conference and are published in *Gamete Biology: Emerging Frontiers on Fertility and Contraceptive Development*.

